

RECEIVED
CENTRAL FAX CENTER

4230-101

Section II (Remarks)

JUN 26 2007

A. Summary of Amendment to the Claims

By the present Amendment, claims 1 and 6 have been amended; and claims 4, 7, 23, and 24 have been cancelled. Claims 12-22 were previously withdrawn by the examiner. No new matter within the meaning of 35 U.S.C. §132(a) has been introduced by the foregoing amendments.

The amendments made herein are fully consistent with and supported by the originally-filed disclosure of this application.

The limitation that 'each particle of said powder has a substantially homogenous composition throughout its volume' is supported by the disclosure in the various passages referring to formation of abrasive powder by atomization of molten metal, such as page 12, lines 12-19; page 13, lines 8-15; and page 27, lines 14-21. Achieving a molten metal from a variety of starting metals requires attainment of a temperature at least as high as the highest melting point of the constituents. In such high temperature liquid state, there exists minimal or no barrier to molecular diffusion between the molten constituent materials.

Any person of ordinary skill in the art understands that the process of forming a molten metal from multiple constituents and ejecting such molten metal through a small atomization nozzle to form particles of a maximum size of 100 μm , forms droplets in which there exists no measurable stratification of constituent materials, such that upon cooling, each resulting particle inherently has a substantially homogenous composition throughout its volume. Third Shimura Declaration, ¶ 15.

B. Response to Rejections Under 35 U.S.C. 112

In the March 8, 2007 Office Action, claims 1-11 and 23-24 were rejected under 35 U.S.C. 112, first paragraph, as the examiner continues to maintain that:

... the specification, while being enabling for the proviso 'when the powder contains titanium in the absence [of] boron and aluminum, the powder further contains silicon in an amount of 0.8 wt. %.' (see table 1, comparison example 5) does not reasonably provide enablement for the proviso as to find in the independent claims (i.e. when the powder contains titanium in the absence [of] boron and aluminum, the powder further contains silicon in an amount of at

4230-101

least 0.8 wt.%. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

March 8, 2007 Office Action, pages 2-3.

As detailed below, because the application in fact does enable one skilled in the art to practice the invention within the scope of the claims, as supported by evidence provided by Applicant, the rejections under 35 U.S.C. 112 are traversed.

I. Law Regarding Enablement Under 35 U.S.C. § 112, First Paragraph

The enablement requirement ensures that the specification and a patent teach those skilled in the art how to make any use the full scope of the claimed invention without undue experimentation. *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997). The first paragraph of Section 112 requires nothing more than objective enablement. *In re Wright*, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993) (emphasis added). The scope of enablement must only bear a "reasonable correlation" to the scope of the claims. *In re Fisher*, 427 F.2d 833, 839, 16 USPQ 18, 24 (CCPA 1970). The fact that some experimentation is necessary does not preclude enablement; what is required is that the amount of experimentation "must not be unduly extensive." *Atlas Powder Co., v. E.I. DuPont de Nemours & Co.*, 224 USPQ 409, 413 (Fed. Cir. 1984). The Patent and Trademark Office Board of Appeal cogently summarized the point when it stated:

"The test is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine, or if the specification in question provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed to enable the determination of how to practice a desired embodiment of the invention claimed." *Ex parte Jackson*, 217 USPQ 804, 807 (1982) (emphasis added).

Whenever the Patent Office asserts that the enabling disclosure is not commensurate in scope with the scope of protection sought by the claims, it is incumbent on the Office to establish a *prima facie* case of lack of enablement. *In re Armbruster*, 512 F.2d 676, 185 USPQ 152 (CCPA 1975); *In re Marzocchi*, 439 F.2d 220, 169 USPQ 367 (CCPA 1971). To meet the

4230-101

burden of proof, the Examiner must advance acceptable reasoning inconsistent with enablement. *In re Straheilevitz*, 668 F.2d 1229, 1232, 212 USPQ 561, 563 (CCPA 1982); *In re Wright*, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993).

Claims are to be given their broadest reasonable interpretation that is consistent with the specification. MPEP 2164.08. "That claims are interpreted in light of the specification does not mean that everything in the specification must be read into the claims." *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 957, 220 USPQ 592, 597 (Fed. Cir. 1983), cert. denied, 469 U.S. 835 (1984) (emphasis added). **Limitations and examples in the specification do not generally limit what is covered by the claims.** MPEP 2164.08. Section 112, first paragraph, does not require a specific example of everything within the scope of a broad claim. *In re Gay*, 50 CCPA 725, 309 F.2d 769, 135 USPQ 311 (1962). Indeed, it is impermissible for the Patent Office to limit all claims to specific examples provided in a specification. *In re Anderson*, 176 USPQ 331, 333 (CCPA 1973)(citing *American Anode, Inc. v. Lee-Tex Rubber Products Corp.*, 136 F.2d 581, 585, 58 USPQ 7, 11 (7th Cir. 1943) and *Smith v. Snow*, 294 U.S. 1 [at pages 11 et seq.], 24 USPQ 26, 30).

The technical field and the completeness of understanding of that field dictate the scope of enablement required to enable broad patent claims under 35 USC § 112. As noted by the predecessor court to the Federal Circuit:

[T]he first paragraph of 35 U.S.C. 112 ... requires that the scope of the claims must bear a **reasonable correlation** to the scope of enablement provided by the specification to persons of ordinary skill in the art. **In cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement** in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws. **In cases involving unpredictable factors, such as most chemical reactions and physiological activity, the scope of enablement obviously varies inversely with the degree of unpredictability of the factors involved.**

4230-101

In re Fisher, 427 F.2d 833, 166 USPQ 18, 24 (CCPA 1970). This is consistent with multiple cases discussed in MPEP section 2164.08 (8th Ed., Rev. Oct. 2005) – the majority of cases in which the disclosure was held to be insufficient to enable the scope of the claims involved biotechnologies and complex chemical reactions. See, e.g., *In re Vaeck*, 947 F.2d 488, 495, 20 USPQ2d 1438, 1444 (Fed. Cir. 1991)¹; *Amgen v. Chugai Pharm. Co.*, 927 F.3d 1200, 18 USPQ2d 1016 (Fed. Cir.), cert. denied, 502 U.S. 856 (1991)²; *In re Wright*, 999 F.3d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)³; *In re Goodman*, 11 F.3d 1046, 1052, 29 USPQ2d 2010, 2015 (Fed. Cir. 1993)⁴; *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 23-24 (CCPA 1970)⁵.

Restating a pertinent portion of the excerpt provided above, a **TWO-PART TEST** for determining if an embodiment provides sufficient support for broad claims directed to mechanical elements is whether:

¹ (section 112, first paragraph rejection sustained as to claims for genetic engineering techniques for producing proteins toxic to mosquito and black fly larvae, in view of relatively incomplete understanding of biology of cyanobacteria as of applicants' filing date and limited disclosure by applicants of particular cyanobacterial genera operative in claimed invention)

² (section 112, first paragraph rejection sustained as to claims directed to a purified DNA sequence encoding polypeptides that are analogs of erythropoietin (EPO) where only a few EPO analog genes were disclosed but claims encompassed all analogs of EPO without disclose of other genetic sequences and how to make them)

³ (section 112, first paragraph rejection sustained as to claims for live non-pathogenic vaccines and processes for making same to elicit immunoprotective activity in any animal toward any RNA virus in view of disclosure of only a single working example directed to a uniquely tailored *in vitro* method of producing a particular recombinant virus vaccine)

⁴ (section 112, first paragraph rejection sustained as to claims for producing mammalian peptides in plant cells where specification contained was limited to producing gamma-interferon in a dicot species, and the evidence supported a need for extensive experimentation to encode mammalian peptide into a monocot plant at the time of filing)

⁵ (section 112, first paragraph rejections sustained for (1) claims covering substantially all adrenocorticotrophic hormones (ACTH) preparations, whether produced synthetically or by breakdown of 39 amino acid peptides, to form a polypeptide containing any number of the amino acids for therapeutic use so long as the product exhibits the threshold activity without side effects where the application taught only the production of 39 amino acid ACTH; and (2) claims covering products having potency (therapeutic activity) greater than 230% of the 1 International Unit standard where such potencies were not obtainable from the disclosure's teachings plus ordinary skill (with the Court specifically noting that the problem was not analogous to the context of substantially pure compositions due to the small or nonexistent range of possible further purification))

4230-101

- (1) other embodiments may be made without difficulty; and**
- (2) the performance of such other embodiments may be predicted by applying known scientific laws.**

In re Fisher, 166 USPQ at 23-24 (CCPA 1970).

2. The Examiner Has Failed to Apply the Proper Legal Test for Enablement

As indicated immediately above, in *In re Fisher, supra*, the predecessor court to the Federal Circuit (the CCPA) established a two-part test for determining whether an embodiment provides sufficient support for broad claims directed to mechanical elements. The examiner erroneously failed to apply such test to the present application.

Regarding the first element of the applicable test under *In re Fisher*, it is clear that embodiments having silicon percentages greater than 0.8 weight percent in the presence of titanium (of not more than 0.1 wt%) and in the absence of boron and aluminum, may be made without any difficulty whatsoever. See Third Shimura Declaration, ¶ 13 ("with the benefit of reading the present application, a person of ordinary skill in the art at the time my invention was made would be easily able to produce abrasive compositions as presently claimed – including amounts of silicon exceeding 0.8 weight percent when the abrasive contains titanium in the absence of boron and aluminum – by merely adjusting the proportion of ingredients supplied to the tundish of the manufacturing device shown and described in the present application, and then measuring the specific gravity, particle diameter / particle size, and hardness characteristics of the resulting powder using conventional methods without require undue experimentation.")

Regarding the second element of the applicable test under *In re Fisher*, it is also clear that the performance of such other embodiments (i.e., embodiments having silicon percentages greater than 0.8 weight percent in the presence of titanium (of not more than 0.1 wt%) and in the absence of boron and aluminum, may be easily predicted by applying known scientific laws. See Third Shimura Declaration, ¶ 12 ("performance of abrasive compositions including amounts of silicon exceeding 0.8 weight percent when the abrasive contains titanium in the absence of boron and aluminum within the scope of the claims of the present invention could be

4230-101

predicted by one of ordinary skill in the art at the time my invention was made, since the effect of silicon content on specific gravity, hardness, and other pertinent characteristics of an abrasive powder could be predicted from any of scientific texts and conventional testing methods that do not require undue experimentation.”)

With the evidence demonstrating the satisfaction of both elements of the applicable test under *In re Fisher*, Applicant has demonstrated that the claimed invention is enabled to one of ordinary skill in the art.

The examiner admits that “the specification is a guidance tool for the skilled artisan.” March 27, 2007 Office Action page 8. The examiner is invited to consider the instant application from the perspective of one skilled in the art, consistent with the foregoing admission, and as required by the Federal Circuit (e.g., *Genentech, Inc. v. Novo Nordisk, A/S*, 108 F.3d 1361, 1365 (Fed. Cir. 1997)(the enablement requirement ensures that the specification and a patent teach those skilled in the art how to make any use the full scope of the claimed invention without undue experimentation). The examiner’s cursory statement that “the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims” is a bare conclusion that is unsupported by any evidence whatsoever..

Critically, Applicant provided an example including exactly 0.8 weight percent silicon, but never stated or suggested that silicon values above 0.8 weight percent could not be used. As indicated by Mr. Shimura, “the present application discloses various abrasive compositions having amounts of silicon exceeding 0.8 weight percent, including compositions having silicon in amounts of 1.3 and 1.4 weight percent (e.g., see application page 17), such that upon reading the present application, **a person of ordinary skill in the art at the time my invention was made would readily understand that the invention is not limited to abrasive compositions having exactly 0.8 weight percent silicon**, whether or not the abrasive further contains titanium in the absence of boron and aluminum.” The examiner is misconstruing the disclosure – as it would be interpreted by one skilled in the art – by indicating that the disclosure requires that silicon of 0.8 weight percent EXACTLY must be used – no more, no less – in spite of incontrovertible evidence to the contrary.

4230-101

Regarding the Examiner's suggestion that "the breadth of the instant claims [reciting] 'at least' 0.8 wt% encompasses any and all values above 0.8 wt%," Applicant notes that **the instant claims contain further limitations (e.g., with respect to specific gravity and hardness) that serve to limit the upper range of possible silicon content.** Such concept would be readily appreciated by one of ordinary skill in the art. See Third Shimura Declaration, ¶ 12 ("performance of abrasive compositions including amounts of silicon exceeding 0.8 weight percent when the abrasive contains titanium in the absence of boron and aluminum within the scope of the claims of the present invention could be predicted by one of ordinary skill in the art at the time my invention was made, since the effect of silicon content on specific gravity, hardness, and other pertinent characteristics of an abrasive powder could be predicted from any of scientific texts and conventional testing methods that do not require undue experimentation.")

In conclusion of this enablement discussion, Applicant's position that the instant claims ARE enabled under 35 U.S.C. 112, first paragraph, is fully supported by the law and the evidence of record. **Applicant is fully prepared to appeal such rejection to the Board of Patent Appeals and Interferences, and Applicant is highly confident of prevailing on appeal.** The examiner is requested to: (1) vigorously review the applicable law relating to enablement as summarized herein, (2) review without prejudice the applicable evidence, and (3) properly apply the law and the evidence to the instant claims. Such proper application of law to the facts compels a finding of enablement, and withdrawal of the rejections under 35 U.S.C. § 112.

D. Response to Rejections Under 35 U.S.C. 102

The March 8, 2007 Office Action, claims 1-8 and 23-24 were rejected under 35 U.S.C. 102(b) as anticipated by U.S. Patent No. 3,696,486 to Benjamin ("Benjamin"). In such Office Action, the examiner admitted that "all of the claimed characteristics of specific gravity and hardness are not literally defined" (Office Action, page 4) but opined that "these characteristics are inherent because the material is the same (stainless steel with the claimed amount of chromium) and the same material is expected to yield the same results (i.e. claimed characteristics) in the absence of any evidence showing the contrary.

Such rejection is traversed in application to the claims as amended herewith.

4230-101

1. Law Regarding Anticipation

"Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration." *W.L. Gore & Assocs. v. Garlock*, 721, F.2d 1540, 220 USPQ 303 at 313 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). It is not enough that the prior art reference disclose all the claimed elements in isolation. Rather, "anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). Further, "[u]nder 35 U.S.C. § 102, anticipation requires that ... the prior art reference must be enabling, thus placing the allegedly disclosed matter in the possession of the public." *Akzo, N.V. v. United States Int'l Trade Comm'n*, 808 F.2d 1471, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986).

2. Disclosure of Benjamin

Benjamin discloses dispersion strengthened precipitation hardenable stainless steels and wrought products formed therefrom. A mixture of powdered constituents are subjected to repeated application of compressive forces, such as by agitation milling that is continued for sufficient time to cause the constituents to comminute and bond or weld together and codisperse throughout the resulting metal matrix of the product powder. (Benjamin, col. 6, lines 33-47.) The mechanical alloy so produced is characterized by a "cohesive internal structure in which the constituents are intimately united together to provide an interdispersion of comminuted fragments of the starting constituents." (Id., col. 6, lines 47-52.) Resulting particles of such alloy are formed without melting any one or more of the constituents. (Id., col. 6, lines 1-9.)

By virtue of Benjamin's agitation milling process, the deformable metals in the mixture are "subjected to a continual kneading action by virtue of impact compression imparted by the grinding elements, during which individual metal components making up the starting powder mixture become comminuted and fragments thereof are intimately united together and become mutually interdispersed to form composite metal particles having substantially the same average composition of the starting mixture." (Id., col. 10, lines 34-43.) **Individual phases present in the product article as comminuted fragments derived from the constituent particles present in**

4230-101

the initial powder mixture **retain their original chemical identity in the mechanically alloyed product powder.** (Id., col. 11, lines 11-16.) The composite product powder is characterized by a dense, cohesive internal structure in which the starting constituents are intimately united together, but still identifiable. (Id., col. 11, lines 28-32.) The product powder particles "comprise comminuted fragments of the initial metal powders welded or metallurgically bonded together, with the dimension across the comminuted fragments being usually less than one-fifth or preferably less than one-tenth the average diameter of the initial metal powder from which the fragment was derived, e.g., less than 10 microns or less than 5 microns or even less than 1 micron, e.g., 0.01 or 0.02 or 0.05 or 1 micron." (Id., col. 11, line 65 – col. 12, line 7.)

Benjamin teaches that "composite metal particles produced in accordance with the invention exhibit an increase in hardness with milling time." (Id., col. 7, lines 43-45.) Benjamin further states that

Where at least one of the compress of the deformable metallic constituents has an absolute melting point substantially above about 1000 K., the resulting composite metal will be heavily cold work to do to impact compression of the particles arising from the repeated collision of elements upon the metal particles. For optimum results, and amount of cold work from particularly useful is that beyond which further milling does not further increase the hardness, this hardest level having been referred to herein before as "saturation hardness."

* * *

the values of saturation hardness obtained processing alloy powders in accordance with this invention frequently reach values between 750 and 850 kg/mm² as measured by Vicker's microhardness techniques. Those skilled in the art will recognize the amazing magnitude of these figures. The saturation hardness obtained in powders processed in accordance with this invention is also far in excess of the values obtained in any other process for mixing metal powders.

(Benjamin, col. 8, lines 9-37.)

The only two specific examples of room temperature hardness values for powders produced by Benjamin's process are:

- 785 Vickers / 794 Vickers (depending on agitation milling time) for a stainless steel composition (Benjamin, Example 1, col. 16, lines 19-59) – as compared to Benjamin's characterization of a conventional "commercial atomized stainless steel composition [having] an as-received hardness of about 233 Vickers" (Id.); and

4230-101

- 421 Vickers for another stainless steel composition, reduced to 390 Vickers by annealing (Benjamin, Example 2, col. 17, lines 8-50).

3. Patentable Distinctions of Claims Over Benjamin

The present application teaches formation of an abrasive composition by melting the starting materials and ejecting the molten material through an atomizing nozzle to form droplets that cool and solidify to form single grains or particles. Achieving a molten metal from a variety of starting metals requires attainment of a temperature at least as high as the highest melting point of the constituents. In such high temperature liquid state, there exists minimal or no barrier to molecular diffusion between the molten constituent materials. As individual (small) droplets of a molten metal are ejected from a small atomization nozzle (i.e., to yield a maximum particle size of 100 μm or less), there exists no measurable stratification of constituent materials, such that upon cooling, each resulting particle has a substantially homogenous composition throughout its volume. (See, e.g., Third Shimura Declaration, ¶ 15.)

Claim 1 specifically requires, *inter alia*, that “each particle of said powder has a substantially homogeneous composition throughout its volume.”

Benjamin specifically *teaches away* from particle having a substantially homogeneous composition throughout. Specifically, Benjamin teaches that **individual phases present in the product article as comminuted fragments** derived from the constituent particles present in the initial powder mixture retain their original chemical identity in the mechanically alloyed product powder. (Id., col. 11, lines 11-16.) The composite product powder is characterized by a dense, cohesive internal structure in which the starting constituents are intimately united together, but still identifiable. (Id., col. 11, lines 28-32.) This is a direct byproduct of Benjamin’s method of forming such particles – namely, by agitation milling.

Individual particles resulting from Benjamin’s agitation milling process do NOT have a substantially uniform composition throughout their volumes, in contrast to particles formed by Applicant’s process of atomizing a molten metal mixture through a nozzle. Thus, for at least the first reason that Benjamin fails to teach “each particle of said powder has a substantially

4230-101

homogeneous composition throughout its volume," Benjamin fails to disclose "each and every element of the claimed invention, arranged in the claim" (*Lindemann, supra*) as required to support an anticipation rejection.

Furthermore, in response to the examiner's suggestion that Benjamin inherently discloses the hardness values recited in the pending claims, is noted that Benjamin specifically teaches the achievement of hardness of "amazing magnitude" (Benjamin, col. 8, lines 9-37), and recites hardness values well above the maximum 340 HMV threshold recited in claim 1. This constitutes ample evidence that Benjamin's stainless steel powder does NOT inherently possess the same hardness characteristics as presently claimed. Thus, for at least the second reason that Benjamin fails to teach the hardness values recited in the claims, Benjamin fails to disclose "each and every element of the claimed invention, arranged in the claim" (*Lindemann, supra*) as required to support an anticipation rejection.

Accordingly, withdrawal of the anticipation rejections premised on Benjamin is warranted, and respectfully requested.

E. Response to Rejections Under 35 U.S.C. 103

The March 8, 2007 Office Action contained multiple rejections under 35 U.S.C. 103, including:

- a rejection of claims 1-8 and 23-24 as being invalid for obviousness over JP-55-148701 in view of U.S. Patent No. 5,135,977 to Achikita et al. ("Achikita")
- a rejection of claims 9-11 as being invalid for obviousness over JP-55-148701 in view of Achikita as applied to claim 1, and further in view of JP 2002-256255, JP 2001-009767 and U.S. Patent No. 6,036,889 to Kydd ("Kydd");
- a rejection of claims 9-11 as being invalid for obviousness over Benjamin in view of JP-55-148701 and further in view of JP 2002-256255, JP 2001-009767 and Kydd.

Such rejections are traversed in application to the claims as amended herewith.

4230-101

I. Law Regarding Obviousness Rejections

To support a rejection under 35 U.S.C. 103, the prior art reference(s) must teach all of the limitations of the claims. MPEP § 2143.03.

In considering a reference for its effect on patentability, the reference is required to be considered in its entirety, including portions of teach away from the invention under consideration. Simply stated, the prior art must be considered as a whole. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984); MPEP § 2141.02. "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *Application of Wesslau*, 353 F.2d 238, 241 (C.C.P.A. 1965); *Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve*, 796 F.2d 443, 448 (Fed. Cir. 1986), *cert. denied*, 484 U.S. 823 (1987).

According to the recent U.S. Supreme Court decision in *KSR International Co. v. Teleflex Inc.*, No. 04-1350, 550 U.S. ___, 127 S.Ct. 1727 (April 30, 2007), the court did not disavow the previous "teaching, motivation or suggestion" or "TSM" test, but stated that such TSM test *should not be strictly applied* in determining obviousness. In connection with this point, the Supreme Court stated that:

"A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art. ... [Rather], it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant art to combine the [prior art] elements in the manner claimed." *KSR*, slip op. at 14.

It is fundamental to a proper rejection of claims under 35 U.S.C. 103 that an examiner must present a convincing line of reasoning supporting the rejection. MPEP 2144 ("Sources of Rationale Supporting a Rejection Under 35 U.S.C. 103"), citing *Ex parte Clapp*, 227 USPQ 972 (Bd. Pat. App. & Inter. 1985). The Supreme Court in *KSR* affirmed the validity of such approach, stating that "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

4230-101

In *KSR*, the Supreme Court further confirmed that references that teach away from the invention are evidence of the non-obviousness of a claimed invention, (*KSR*, slip op. at pp. 20-23) and reaffirmed the principle that a factfinder judging patentability "should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning."

Non-analogous art may only be combined under specific circumstances to support an obviousness rejection. As stated by the court in *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1445 (Fed. Cir. 1992),

"[i]n order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either [1] be in the field of applicant's endeavor or, if not, then [2] be reasonably pertinent to the particular problem with which the inventor was concerned." (Numbers added for clarity.)

In determining whether prior art is "reasonably pertinent to the particular problem with which the inventor was concerned," the intended use is important and should under the circumstances be considered for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. See MPEP 2173.05(g).

2. Disclosure of JP-55-148701

JP 55-148701 recites a composition of a metal (stainless steel) powder including B (0.05 – 2 wt%); C (< 0.3%); Si (< 1.5%); Mn (< 2%); Ni (2 – 22 %); Cr (10 – 25%); Mo (0.5 – 4%); and the remainder Fe.

Nothing in JP 55-148701 discloses or suggests titanium in an abrasive composition as presently claimed.

3. Disclosure of Achikita

Achikita et al. describes an **injection molding composition** composed of a sinterable powder comprising at least one metal or alloy and a binder containing from 10 to 80% by weight of a

4230-101

low-density polyethylene, from 10 to 80% by weight of a paraffin wax and from 5 to 35% by weight of a boric acid ester (e.g., triglycol diborates, trialkyl borates, glycerol borates and alkyl diborates), with the ratio of the sinterable powder to the binder in the composition being from 30 to 70% by volume of the former and from 70 to 30% by volume of the latter. **Sintering is a process of heating to bind powdered components together to yield a solid.** The sinterable powder is a powder of at least one selected from pure iron, stainless steel, carbonyl iron and pure cobalt. Achikita et al. has been cited for teaching "that powders generally have the claimed size" (pages 4-5 of the March 27, 2007 Office Action). Whether Achikita's powder size is appropriate for sintering (joining particles together through heating) to yield a finished product, however, is immaterial to the size of powder to be used as an abrasive composition for grinding. **Nothing in Achikita suggests the use of titanium in an abrasive composition as presently claimed.**

3. Disclosure of JP 2002-256255

The primary reference JP 2002-256255 describes a coagulation- and agglomeration-resistant polishing material that overcomes water-related problems, in which surfaces of spherical inorganic particles are treated with a water-repellency-imparting substance. JP 2002-256255 has been cited as teaching that surface treating an abrasive (stainless steel) with the claimed material in an amount of 0.01-5% improves the performance of the abrasive. March 27, 2007 Office Action, page 6.

As previously acknowledged by the examiner, **nothing in JP 2002-256255 discloses or suggests titanium** in an abrasive composition as presently claimed.

4. Disclosure of JP2001-0009727

JP2001-0009727 describes an abrasive blasting composition composed of inorganic particle powder and meeting all the following conditions (1) to (4):

- (1) $10 \leq A \leq 0.8C$ $0.03C \leq B \leq 0.5C$
- (2) $50 \leq C \leq 800$
- (3) $30 \leq D \leq 95$

4230-101

$$(4) \quad E_2 - 3.5 \leq E_1 \leq E_2 - 0.5$$

wherein:

- A: maximum particle size (μm) of the abrasive
- B: average particle diameter (μm) of the abrasive
- C: partition width d_1 + ground groove width d_2 (μm) at processing pitch
- D: an index (%) representing indeterminate forms of particles and indicating an area ratio of a particle projected area to a circumcircle
- E_1 : Mohs hardness of the abrasive
- E_2 : lower Mohs hardness of either the substrate or an electrode

JP2001-0009727 discloses that the abrasive can be any inorganic particle powder, natural or synthetic, e.g., natural inorganic particle powders such as limestone, barite and gypsum, and synthetic inorganic particle powders such as calcium carbonate, barium sulfate and calcium sulfate.

JP2001-0009727 has been cited as teaching, in sections [0026]-[0027] thereof, that surface treating an inorganic powder (abrasive) ... with the claimed material in an amount of 0.01-5% improves the performance of the abrasive. March 27, 2007 Office Action, page 6.

Nothing in JP2001-0009727 discloses or suggests titanium in an abrasive composition as presently claimed.

5. Disclosure of Kydd

Kydd discloses a mixture of metal powders and metallo-organic decomposition (MOD) compounds in an organic liquid vehicle. The metal can be any of copper, silver, gold, zinc, cadmium, palladium, iridium, ruthenium, osmium, rhodium, platinum, iron, cobalt and nickel, (Groups Ib, IIb and VIII), and indium, tin, antimony, lead and bismuth. Kydd has been cited for teaching (i.e., at column 8, line 66 - column 9, line 6) that it is well known to surface treat metal particles with stearic acid in order to prevent agglomeration. March 27, 2007 Office Action, page 6.

Nothing in Kydd discloses or suggests titanium in an abrasive composition as presently claimed.

4230-101

6. Patentable Distinctions of Pending Claims Over the Cited References

Amended independent claim 1 recites, *inter alia*, "an inorganic metal powder that contains titanium in an amount of not more than 0.1 wt% and contains silicon in an amount of at least 0.8 wt%"

The rejection under 35 U.S.C. 103 of claim 1 was based on JP-55-148701 and Achikita. Neither of these references disclose the use of titanium in an abrasive composition, let alone the abrasive as presently claimed in claim 1.

None of the other cited references remedy the deficiency of the disclosures of JP-55-148701 and Achikita in this regard, as none of the other cited references teach or suggest the use of titanium in an abrasive composition.

It is axiomatic that to support any rejection under 35 U.S.C. 103, the prior art reference(s) must teach all of the limitations of the claims. MPEP § 2143.03. For at least the reason that none of the cited references teach the use of titanium in an abrasive composition, withdrawal of the rejection of claim 1 under 35 U.S.C. 103 is warranted, and is respectfully requested.

Moreover, since the remaining claims depend (whether directly or indirectly) from claim 1, and dependent claims inherently include all of the limitations of the claims on which they depend, the remaining dependent claims are likewise distinguished over the art of record. Accordingly, withdrawal of all of the claim rejections under 35 U.S.C. 103 is warranted, and is respectfully requested.

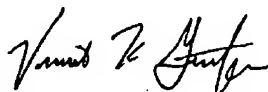
JUN 26 2007

4230-101

CONCLUSION

Based on the foregoing, all of Applicants' pending claims 1-3, 5, 6, and 8-11 are patentably distinguished over the art, and in form and condition for allowance. The examiner is requested to favorably consider the foregoing, and to responsively issue a Notice of Allowance. If any issues amendable to telephonic resolution remain outstanding, then the examiner is requested to contact the undersigned attorney at (919) 419-9350 to discuss and resolve such issues without delay.

Respectfully submitted,



Vincent K. Gustafson
Reg. No. 46,182
Attorney for Applicants

INTELLECTUAL PROPERTY/
TECHNOLOGY LAW
Phone: (919) 419-9350
Fax: (919) 419-9354
Attorney File No.: 4230-101

Enclosure:

Declaration of Tokihiro Shimura Under 37 CFR 1.132 [5 pgs.]

The USPTO is hereby authorized to charge any deficiency or credit any overpayment of fees properly payable for this document to Deposit Account No. 08-3284